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PESTS NOT KNOWN TO OCCUR IN THE UNITED STATES OR OF
LIMITED DISTRIBUTION, NO. 14: ORANGE SPINY WHITEFLY

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Order: Family

Homoptera: Aleyrodidae

Pest

ORANGE SPINY WHITEFLY
Aleurocanthus spiniferus (Quaintance)

Economic
Importance

A. spiniferus has been called the most destructive aleyrodid infesting citrus in tropical Asia. It has been rated as the seventh most important citrus insect, the most important of more than four citrus-feeding aleyrodid species in Japan. An outbreak in the Kyushu area was devastating until brought under control in the early 1920's by the parasite Prospaltella smithi Silvestri, a eulophid wasp. A. spiniferus had become the most serious pest on the island of Guam, but by 1953 introduced parasites had effectively controlled the outbreak. Trees heavily infested with this whitefly lose vitality and continued heavy infestations eventually lead to tree mortality (U.S. Department of Agriculture 1959).

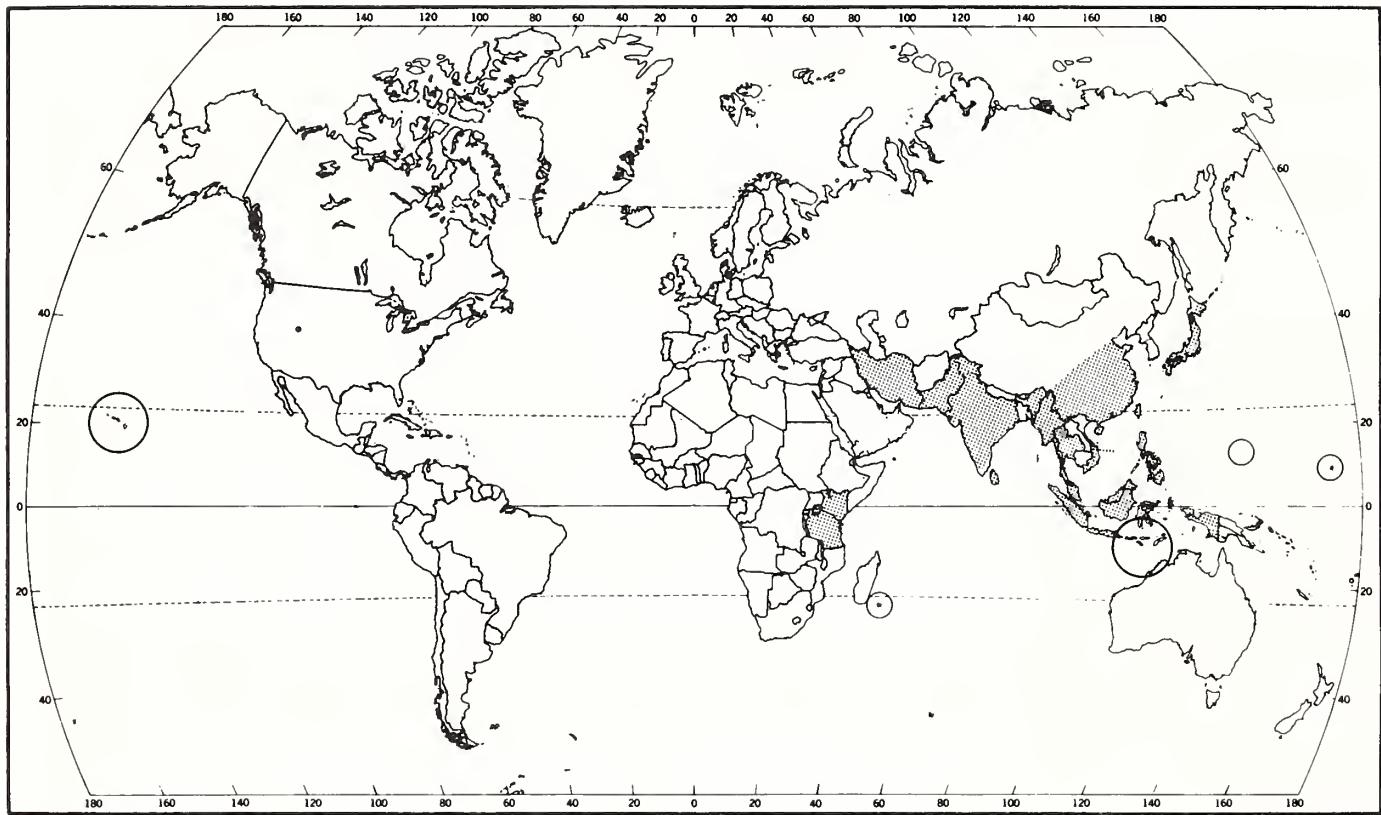
Hosts

The host list includes Akebia spp. (akebia), Citrus spp. (citrus), Diospyros spp. (persimmon), Myroxylon spp. (balmtree), Psidium spp. (guava), Pyrus spp. (pear), Rosa spp. (rose), Salix spp. (willow), and Vitis spp. (grape) (Mau et al. 1974).

General
Distribution

A. spiniferus occurs in Asia: China, Hong Kong, India, Indonesia, Iran, Japan, Macao, Malaysia, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand, and Vietnam; in Africa: Kenya, Mauritius, and Tanzania; and Pacific Islands: Guam and Truk (Caroline Islands) (Commonwealth Institute of Entomology 1976). It has been recorded by several authors from Jamaica, but apparently these records were based on misidentifications, according to L. M. Russell of the U.S. National Museum of Natural History (Weems 1962).

In the United States, this species is present in Guam (see above) and Hawaii, first detected in 1974 on Oahu (Mau et al. 1974).



Aleurocanthus spiniferus map prepared by USDA, APHIS, PPQ,
Biological Assessment Support Staff

Characters

ADULTS - Female 1.33 mm and male 0.96 mm long, orange yellow shaded with brownish purple and sprinkled with white waxy powder, eyes reddish, antennae and legs yellowish, thorax yellowish with purple markings, forewings length 1.29 mm and width 0.6 mm, color pattern of wings variable (fig. A). The male genitalia is useful in distinguishing among similar species (fig. B).

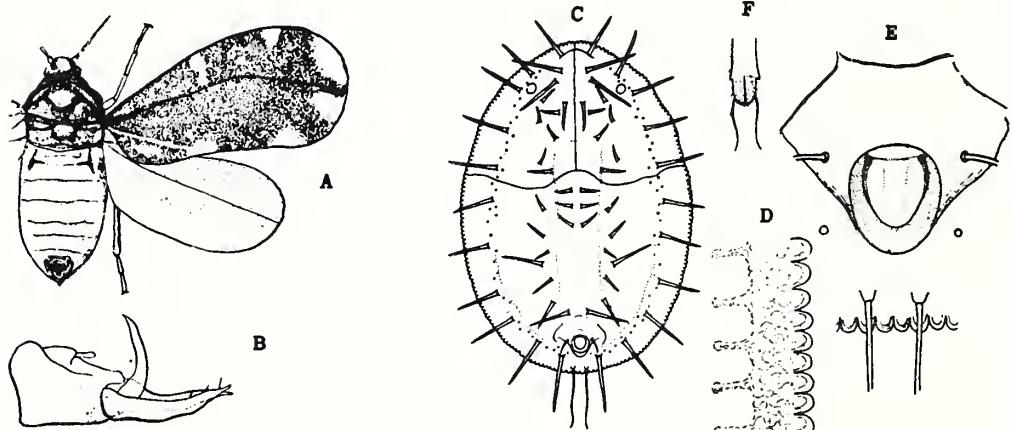
EGGS - On short stalks that hold them upright on the leaves. Creamy yellowish, 0.2 mm long by 0.1 mm wide, curved and marked with minute polygonal areas.

LARVAE - First instar 0.315 by 0.153 mm, second instar 0.4 by 0.3 mm, and third instar 0.66 by 0.525 mm. Body elliptical brownish to black, with short cottony fringe of wax all around. Spines stout and numerous.

PUPAE - Females larger than males, size of case 1.23 by 0.88 mm, length about 1 mm, convex, oval, black, (fig. G) with a marginal band of white waxy secretion. Dorsum arched and median area prominent especially at the vasiform orifice which is elevated subcordate tending to circular and is almost entirely filled with the operculum (fig. E). Pupa case with 16-26 spines that form the submarginal ring (figs. C and H), submarginal spines not long and prominent, average 0.22 mm, extend beyond the margin of case (figs. C, D, and H). There is a subdorsal row of shorter spines and a submedian row of still shorter ones. Caudal margin with pair of setae and another pair situated near cephalic margin of vasiform orifice (fig. E). Margin is strongly dentate (fig. D). Teeth of margin not large or acute, moderate in size, 12 teeth per 0.1 mm.

Aleurocanthus woglumi (see article #15 in this series) and A. spiniferus are difficult to distinguish (see detection notes). In summary the differences are: The pupae of the latter have narrower marginal teeth, and the size and arrangement of the spines differ, those of A. woglumi being the larger; the color and pattern of the wings of the adults also are distinctive (Weems 1974, U.S. Department of Agriculture 1959, Kuwana 1928, Quaintance and Baker 1917).

(Figs. A, B, C, D, E, F)



A. spiniferus: A - Adult female; B - Male genitalia; C - Pupa case (dorsal view); D - Margin of pupa case; E - Vasiform orifice with caudal margin; F - Lingula (figs. from Kuwana 1928)

(Fig. G)



Pupae of A. spiniferus

(Fig. H)



Slide mount of A. spiniferus pupae showing pattern of marginal teeth and spines

Characteristic
Damage

This species excretes honeydew that falls on the leaves, causing the growth of a sooty mold which interferes with the normal function of the leaves, reducing respiration and photosynthesis. During heavy infestations, the sooty mold also occurs on the fruit, lowering its quality. Continual heavy infestation leads to tree mortality.

Detection
Notes

1. Inspect for spiral egg masses and larvae on underside of leaves. The larvae of this species resemble A. woglumi but the arrangement of the spines differ. A. spiniferus is indistinguishable from A. woglumi in the field.
2. Detection can be done any time of the year, but adults would not be found during the winter.
3. Watch for honeydew, sooty mold on leaves and fruit, and ant trails.
4. The colorful adult may be found periodically, assembled on tender terminal growth (Paddock 1976, personal communication)

Natural
Enemies

Listed below are the various natural enemies which have been found to attack A. spiniferus throughout subtropical and tropical Asia (Clausen 1934).

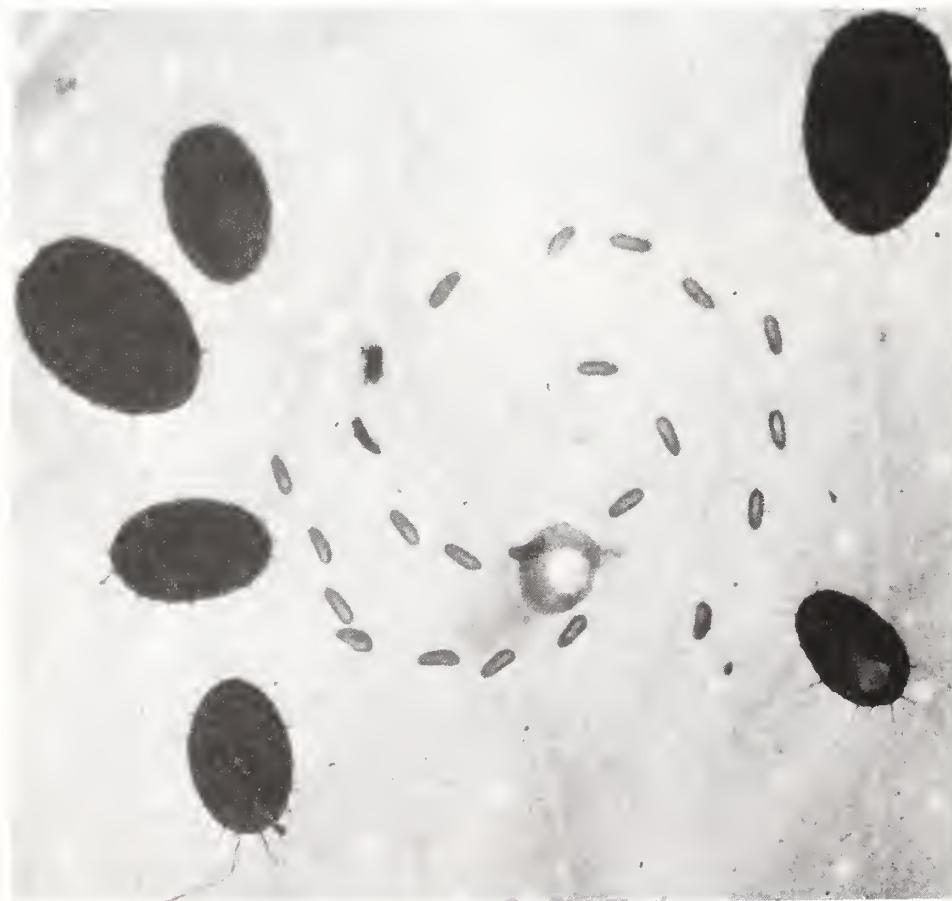
Parasites: Amitus hesperidum subsp. variipes Silvestri, and Amitus sp., platygasterid wasps; Encarsia merceti Silvestri, Eretmocerus serius Silvestri, Prospaltella divergens Silvestri, Prospaltella ishii Silvestri, Prospaltella smithi Silvestri, and Prospaltella sp., eulophid wasps.

Predators: Acletoxenus indica Malloch and Acletoxenus sp., drosophilid flies; Chrysopa fulvolineata and Chrysopa sp., green lacewings; Cryptognatha sp., Delphastus sp., and Scymnus sp. near pallidicollis Mulsant, lady beetles.

Biology

A. spiniferus deposits as few as 12-13 eggs in a spiral pattern on the underside of leaves (fig. I). Incubation varies, depending on temperature, and averages 22 days in May, 7 in July, 11 from August to September, and 15 from September to October. There are four broods per year in Japan. The insect overwinters in the third larval stage, reaching the pupal stage about the middle of March. The adult emerges from the middle to the end of April, second brood adults emerge the last part of June, the third brood the first part of August, and the fourth brood during the last part of September. Adults are active on fine days but are quiet during cloudy or rainy weather. They prefer the undersides of new leaves (U.S. Department of Agriculture 1959).

(Fig. I)



Aleurocanthus spiniferus: Spiral pattern of eggs

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